WHAT IS CLAIMED IS:

1. A device for analyzing immunoassays with a liquid assay medium, comprising:

a vessel for holding the assay medium and having a base comprised of a solid body, the solid body having a first side wall and a top surface constituting a bottom surface of the vessel and forming a boundary surface of the solid body, wherein first reaction agents are dissolved in the assay medium in the vessel and are labeled with a luminophore or different luminophores and second reaction agents are bonded to the boundary surface within a boundary layer of the assay medium;

a transmitter for emitting light rays that are coupled into the base of the vessel via the first side wall and conducted at the total reflection angle to the boundary surface so that luminophore-labeled first reaction agents that are bonded to the second reaction agents are optically excited by at least some of the light rays and emit at least one of fluorescent and phosphorescent rays; and

a receiver positioned for quantitatively detecting the at least one of the fluorescent rays and phosphorescent rays.

2. The device according to claim 1, wherein the base of the vessel has a second side wall arranged opposite from the first side wall, wherein both the first and second side walls are flat and extend at an angle of less than 90° to the boundary surface, the transmitted light rays are coupled into the base via the first side wall and, following a total reflection at the boundary surface, are coupled out via the second side wall.

3. The device according to claim 2, wherein the first and second side walls of the base extend symmetrically to a symmetry plane of the base.

4. The device according to claim 2, wherein the vessel has an essentially hollow-cylindrical shape, the base is circularly cylindrical, and the first and second sidewalls comprise sloping sides for the circularly cylindrical base.

5. The device according to claim 1, wherein the vessel has an open top presenting an upper edge, and the device further includes a disk-shaped attachment adjoining the

upper edge for facilitating insertion of the vessel into a holder.

6. The device according to claim 5, wherein the attachment has a rectangular cross section presenting longitudinal sides that can be attached to the holder.

7. The device according to claim 5, wherein the attachment has one side edge adapted for receiving a marking characterizing the content of the vessel.

8. The device according to claim 5, wherein the vessel and attachment comprise one piece.

9. The device according to claim 1, wherein the vessel comprises an injection-molded plastic part.

10. The device according to claim 9, wherein ~~at the vessel~~ is comprised of polystyrene.

11. The device according to claim 1, wherein the transmitter is arranged so that the transmitted light rays

outside of the vessel extend parallel to the boundary surface of the vessel.

12. The device according to claim 1, wherein the base has an underside and the receiver is arranged so that the at least one of the fluorescent rays and phosphorescent rays are coupled out via the underside of the base and conducted to the receiver.

13. The device according to claim 1, further comprising an optical swamp arranged so that the light rays transmitted into the base via the first side wall are conducted to the optical swamp after the light rays exit from the vessel.

14. The device according to claim 1, wherein the transmitter comprises a laser and a polarization filter connected downstream of the laser.

15. The device according to claim 13, further comprising an arrangement of mirrors and upstream connected polarization filters for transmitting the light rays repeatedly through the base of the vessel and onto the boundary surface.

16. The device according to claim 1, wherein the transmitter is operable in a pulsed mode having a pulse-break ratio of transmitting light pulses selected such that optically excited luminophores emit fluorescent rays during emission of a transmitting light pulse and emit phosphorescent rays during transmitting breaks.

17. The device according to claim 16, wherein two different first reaction agents are labeled with different luminophores, the first luminophores have a high fluorescence and low phosphorescence and the second luminophores have high phosphorescence and a low fluorescence.

18. The device according to claim 16, wherein the first reaction agents are detected with a time delay in that the fluorescent rays from the first luminophores are recorded during the emission of the transmitting light pulses and the phosphorescent rays from the second luminophores are recorded during the transmitting breaks.

19. The device according to claim 1, wherein the receiver is one of a photo-multiplier, a PIN detector, and an avalanche diode, and includes a polarization filter, a receiving optic, and an interference filter installed in front.

20. The device according to claim 1, wherein the transmitter comprises a plurality of transmitters and the vessel comprises a multiple arrangement of vessels onto which light rays emitted by the transmitters are respectively focused, and the receiver is a common receiver for recording the fluorescent rays exiting from the individual vessels.

21. The device according to claim 20, wherein the transmitters are activated individually, one after another.

22. The device according to claim 20, wherein the vessels are arranged in a linear arrangement of vessels.

23. The device according to claim 20, further including a polygonal mirror and wherein the vessels are arranged concentrically to the polygonal mirror so that the

fluorescent rays exiting at the vessels are conducted via the polygonal mirror to the receiver.